

ZXTN25012EFL

12V, SOT23, NPN low power transistor

Summary

$BV_{CEO} > 12V$

$BV_{ECO} > 4.5V$

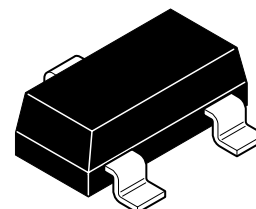
$h_{FE} > 500$

$I_{C(cont)} = 2A$

$V_{CE(sat)} < 65\text{ mV @ } 1A$

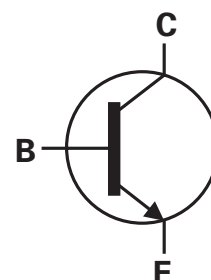
$R_{CE(sat)} = 46\text{ m}\Omega$

$P_D = 350mW$



Description

Advanced process capability has been used to achieve high current gain hold up making this device ideal for applications requiring high pulse currents.

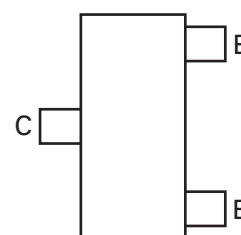


Features

- High peak current
- Low saturation voltage
- 6V reverse blocking voltage

Applications

- MOSFET and IGBT gate driving
- DC-DC conversion
- LED driving
- Interface between low voltage IC's and load



Pinout - top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN25012EFLTA	7	8	3000

Device marking

1B6

ZXTN25012EFL

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	20	V
Collector-emitter voltage	V_{CEO}	12	V
Emitter-collector voltage	V_{ECO}	4.5	V
Emitter-base voltage	V_{EBO}	7	V
Continuous collector current ^(a)	I_C	2	A
Base current	I_B	500	mA
Peak pulse current	I_{CM}	15	A
Power dissipation @ $T_{amb} = 25^{\circ}\text{C}^{(a)}$	P_D	350	mW
Linear derating factor		2.8	mW/ $^{\circ}\text{C}$
Operating and storage temperature range	T_j, T_{stg}	- 55 to 150	$^{\circ}\text{C}$

Thermal resistance

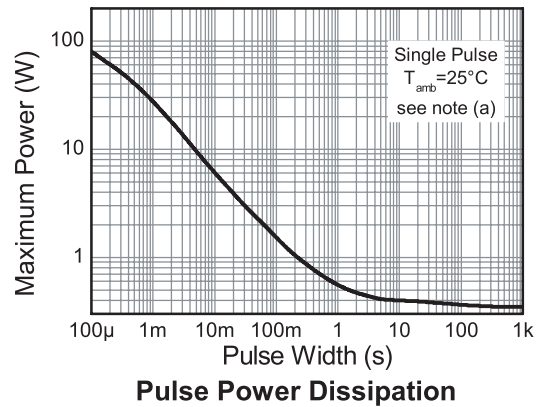
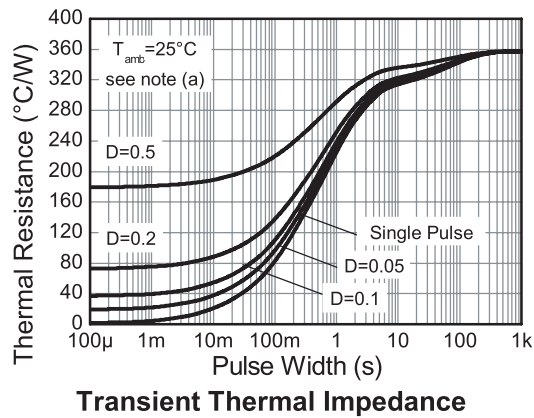
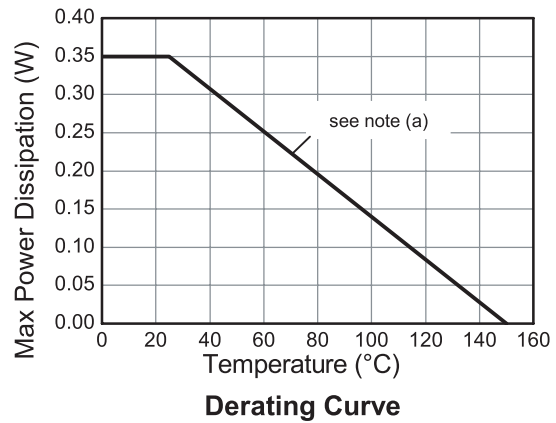
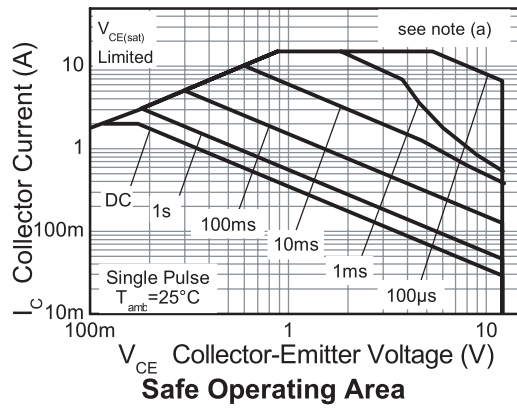
Parameter	Symbol	Limit	Unit
Junction to ambient ^(a)	$R_{\theta JA}$	357	$^{\circ}\text{C}/\text{W}$

NOTES:

(a) For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

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Characteristics



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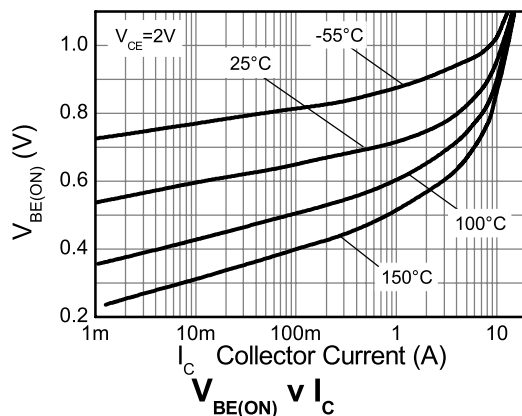
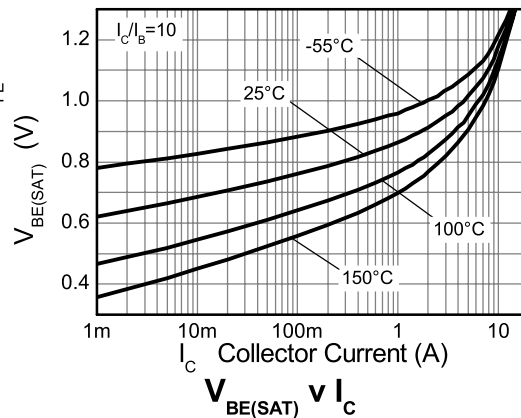
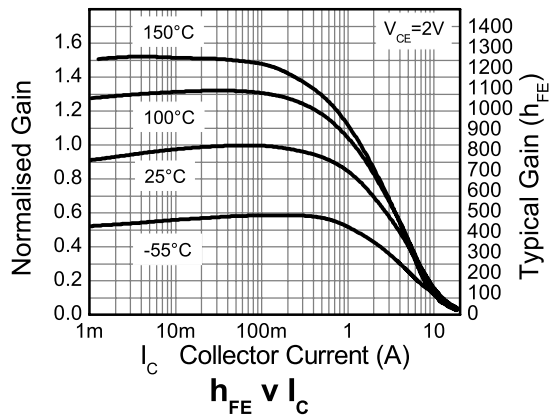
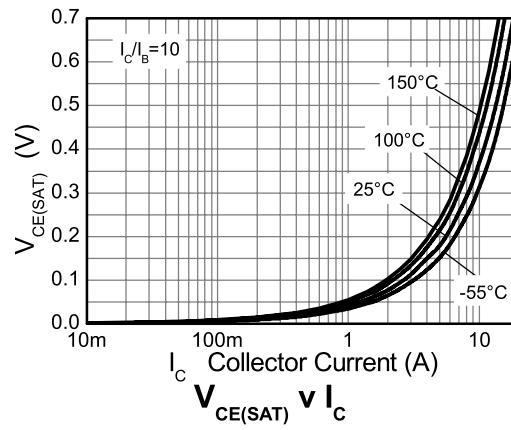
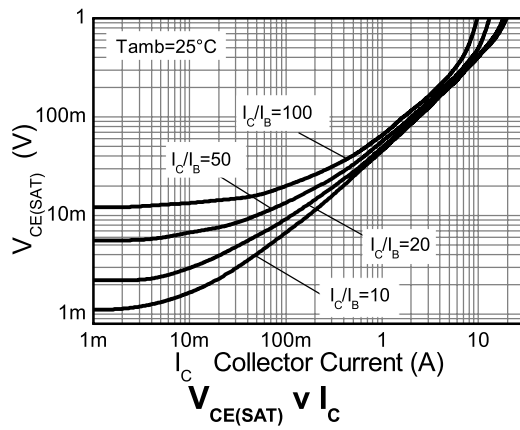
Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	20	40		V	$I_C = 100\mu\text{A}$
Collector-emitter breakdown voltage	BV_{CEO}	12	17		V	$I_C = 10\text{mA}^{(*)}$
Emitter-base breakdown voltage	BV_{EBO}	7	8.3		V	$I_E = 100\mu\text{A}$
Emitter-collector breakdown voltage (reverse blocking)	BV_{ECX}	6	8		V	$I_E = 100\mu\text{A}$, $R_{BC} \leq 1\text{k}\Omega$ or $0.25\text{V} > V_{BC} > -0.25\text{V}$
Emitter-collector breakdown voltage (base open)	BV_{ECO}	4.5	5.5		V	$I_E = 100\mu\text{A}$,
Collector cut-off current	I_{CBO}		<1	50 20	nA μA	$V_{CB} = 16\text{V}$ $V_{CB} = 16\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
Emitter-base cut-off current	I_{EBO}		<1	50	nA	$V_{EB} = 5.6\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$		50 70 105 235	65 85 130 300	mV mV mV mV	$I_C = 1\text{A}$, $I_B = 100\text{mA}^{(*)}$ $I_C = 1\text{A}$, $I_B = 10\text{mA}^{(*)}$ $I_C = 2\text{A}$, $I_B = 40\text{mA}^{(*)}$ $I_C = 5\text{A}$, $I_B = 100\text{mA}^{(*)}$
Base-emitter saturation voltage	$V_{BE(sat)}$		830	950	mV	$I_C = 2\text{A}$, $I_B = 40\text{mA}^{(*)}$
Base-emitter turn-on voltage	$V_{BE(on)}$		745	850	mV	$I_C = 2\text{A}$, $V_{CE} = 2\text{V}^{(*)}$
Static forward current transfer ratio	h_{FE}	500 500 370 210 30	800 700 575 335 55	1500		$I_C = 10\text{mA}$, $V_{CE} = 2\text{V}^{(*)}$ $I_C = 1\text{A}$, $V_{CE} = 2\text{V}^{(*)}$ $I_C = 2\text{A}$, $V_{CE} = 2\text{V}^{(*)}$ $I_C = 5\text{A}$, $V_{CE} = 2\text{V}^{(*)}$ $I_C = 15\text{A}$, $V_{CE} = 2\text{V}^{(*)}$
Transition frequency	f_T		260		MHz	$I_C = 50\text{mA}$, $V_{CE} = 10\text{V}$ $f = 100\text{MHz}$
Output capacitance	C_{obo}		25	35	pF	$V_{CB} = 10\text{V}$, $f = 1\text{MHz}^{(*)}$
Delay time	$t_{(d)}$		71		ns	$V_{CC} = 10\text{V}$ $I_C = 1\text{A}$, $I_{B1} = I_{B2} = 10\text{mA}$
Rise time	$t_{(r)}$		70		ns	
Storage time	$t_{(s)}$		233		ns	
Fall time	$t_{(f)}$		72		ns	

NOTES:

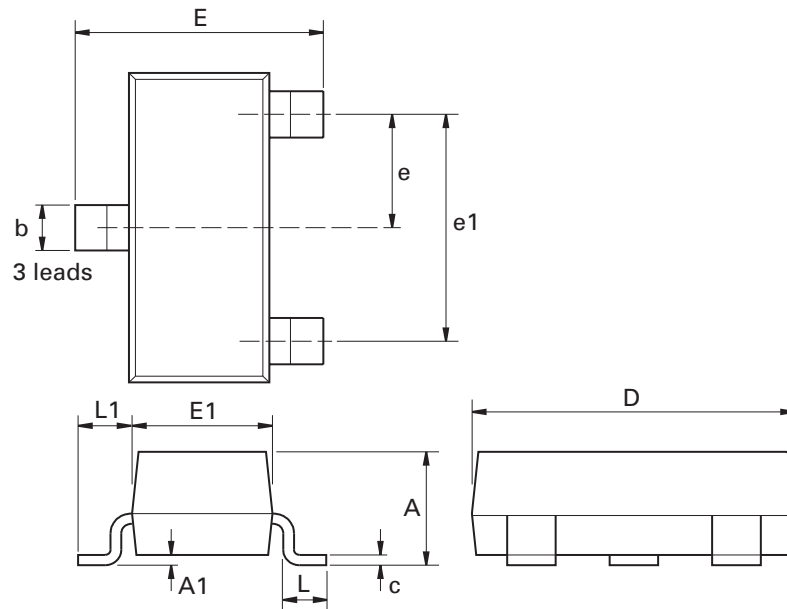
(*) Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

Typical characteristics



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Package outline - SOT23



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Max.	Max.
A	-	1.12	-	0.044	e1	1.90 NOM		0.075 NOM	
A1	0.01	0.10	0.0004	0.004	E	2.10	2.64	0.083	0.104
b	0.30	0.50	0.012	0.020	E1	1.20	1.40	0.047	0.055
C	0.085	0.120	0.003	0.008	L	0.25	0.62	0.018	0.024
D	2.80	3.04	0.110	0.120	L1	0.45	0.62	0.018	0.024
e	0.95 NOM		0.0375 NOM		-	-	-	-	-

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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